AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior versions of claims in the application.

1. (Currently Amended) A molding manufacturing method, comprising:

preparing a co-extruded long molding body including a molding main body made of thermoplastic material and a decorative layer higher than the molding main body in hardness and melt temperature, ~~the molding main body and the decorative layer formed integrally by co-extrusion~~ so that the decorative layer is provided along a longitudinal direction of the molding main body on a surface thereof;

setting the molding body in a fixed die such that a back surface side of said co-extruded long molding body which is opposite of said decorative layer faces said fixed die;

heating and softening an end portion of the molding body while maintaining a condition in which the decorative layer is harder than the molding main body, by irradiating an infrared ray onto a back surface of the molding main body corresponding to the end portion of the molding body; and

press forming the end portion of the molding body, while maintaining a condition in which the decorative layer is harder than the molding main body, by pressing a movable punch onto the fixed die while the end portion of the molding body is in a heated and softened state to bend the end portion of the molding body to obtain an end cover portion having a predetermined shape,

wherein said press forming is performed in an oblique direction with respect to the longitudinal direction of the molding, so that the decorative layer of the end portion moves closer

to the fixed die.

2. (Original) The molding manufacturing method according to claim 1, wherein, in the heating and softening step, an irradiation amount of the infrared ray onto the back surface of the molding main body is made alternately increase and decrease with a lapse of time.

3. (Original) The molding manufacturing method according to claim 1,

wherein in the heating and softening step, a near infrared ray is irradiated by the use of a near infrared heating device.

4. (Previously Presented) The molding manufacturing method according to claim 3,

wherein the near infrared heating device includes a near infrared lamp and a reflecting mirror for reflecting the near infrared ray emitted from the near infrared lamp to form a focal point; and

the near infrared ray is irradiated substantially uniformly onto the back surface of the molding main body from a position separated farther than a focal length of the reflecting mirror.

5. (Currently Amended) A molding manufacturing method, comprising:

preparing a co-extruded long molding body including a molding main body made of thermoplastic material and a decorative layer higher than the molding main body in hardness and melt temperature, ~~the molding main body and the decorative layer formed integrally by co-~~

~~extrusion~~ so that the decorative layer is provided along a longitudinal direction of the molding main body on a surface thereof;

setting the molding body in a fixed die such that a back surface side of said co-extruded long molding body which is opposite of said decorative layer faces said fixed die;

heating and softening an end portion of the molding body while maintaining a condition in which the decorative layer is harder than the molding main body; and

press forming the end portion of the molding body, while maintaining a condition in which the decorative layer is harder than the molding main body, by moving the movable punch obliquely toward the fixed die along a predetermined path such that the movable punch fits with the fixed die at an end of the path, to bend the end portion of the molding body,

wherein said press forming is performed in an oblique direction with respect to the longitudinal direction of the molding, so that the decorative layer of the end portion moves closer to the fixed die.

6. (Original) The molding manufacturing method according to claim 5, wherein the press forming step includes fixing the molding body in a longitudinal direction thereof in the fixed die.

7. (Previously Presented) The molding manufacturing method according to claim 5, wherein in the press forming step, the predetermined path is set as a line which divides a bending angle of the fixed die into halves.

8. (Previously Presented) The molding manufacturing method according to claim 5, wherein in the press forming step, the predetermined path is set as a nonlinear path.

9. (Previously Presented) The molding manufacturing method according to claim 8, wherein the nonlinear path is separate from a line dividing a bending angle of the fixed die into halves, except in the vicinity of a position where the movable punch fits with the fixed die.

10. (Original) The molding manufacturing method according to claim 5, wherein in the press forming step, the fixed die and the movable punch is kept at a constant temperature cooler than the temperature of the end portion.

11. (Original) The molding manufacturing method according to claim 5, further comprising: trimming an end of the bent end portion.

12. (Original) The molding manufacturing method according to claim 5, wherein in the press forming step, the end portion is bent while slightly compressed between a forming surface of the fixed die and a forming surface of the movable punch.

13. (Currently Amended) A molding manufacturing method, comprising:

~~extrusion molding~~ co-extruding a molding body, made of a thermoplastic material including a molding main body, a leg portion and a pair of protruding portions, ~~the molding main~~

~~portion being integrally co-extruded with~~ and a thermoplastic decorative layer harder than the molding main body, the leg portion protruding from a back surface of the molding main body, the pair of protruding portions each protruding from one of both sides of the leg portion in a width direction of the molding main body;

cutting the molding body into a cut piece having a predetermined length;

removing the protruding portions from a back side of an end portion of the cut piece to form a first region thereon;

removing the leg portion to form a second region consecutive with a distal side of the first region to form a step between the first region and the second region on the back side;

positioning the cut piece in a longitudinal direction thereof by bringing the step into contact with the fixed die;

setting the molding body in the fixed die such that a back side surface of said co-extruded molding body which is opposite of said decorative layer faces said fixed die;

heating and softening an end portion of the cut piece while maintaining a condition in which the decorative layer is harder than the molding main body, by irradiating an infrared ray onto a back surface of the molding main body corresponding to the end portion of the molding body; and

press forming the second region of the end portion of the cut piece by pressing a movable punch onto the fixed die while the end portion of the cut piece is in a heated and softened state to bend the second region of the end portion of the cut piece to obtain an end cover portion having a predetermined shape,

wherein said press forming is performed while maintaining a condition in which the decorative layer is harder than the molding main body, and

wherein said press forming is performed in an oblique direction with respect to the longitudinal direction of the molding, so that the decorative layer of the end portion moves closer to the fixed die.

14. (Previously Presented) The molding manufacturing method according to claim 13, wherein the step of extrusion molding includes embedding a core material having a rigidity larger than that of the molding main body into the leg portion;

the step of removing the leg portion includes removing the core material to obtain the main body portion without the core material in the second region; and

in the step of press forming the second region of the end portion of the cut piece, the main body portion without the core material is bent.

15. (Withdrawn) A molding manufacturing apparatus, comprising:

a fixed die into which a molding body is to be set;

a movable plate arranged movably in forward and backward directions substantially perpendicular to a reference line along a longitudinal direction of the molding body set in the fixed die;

a movable punch attached on the movable plate and guided movably in forward and backward directions substantially perpendicular to a moving direction of the movable plate; and

a driving mechanism for driving the movable punch to move forward when the movable plate is moved forward;

wherein the movable punch is moved in an oblique direction to close the fixed die therewith to press form an end portion of the molding body, the oblique direction being a synthesized direction of a forward moving direction of the movable plate and a forward moving direction of the movable punch.

16. (Withdrawn) The molding manufacturing apparatus according to claim 15, wherein the driving mechanism includes a driving source and a linking member which transmits a driving force of the driving source to the movable punch to shift the movable punch.

17. (Withdrawn) The molding manufacturing apparatus according to claim 16, wherein the driving source includes an electric motor rotatable in a normal direction and a reverse direction; and

the linking member converts a rotational motion into a linear motion.

18. (Withdrawn) The molding manufacturing apparatus according to claim 16, wherein the driving source includes a fluid cylinder for actuating the movable punch in the forward and backward directions.

19. (Withdrawn) The molding manufacturing apparatus according to claim 15, further comprising

a control unit that detects a travel distance of the movable plate and controls the driving mechanism according to the detected travel distance.

20. (Withdrawn) The molding manufacturing apparatus according to claim 15, wherein the driving mechanism includes a cam mechanism having a cam follower and a cam groove.

21. (Withdrawn) The molding manufacturing apparatus according to claim 15, wherein each of the fixed die and the movable punch has a forming surface for pressing the end portion of the molding body to bend at a substantially right angle.

22. (Withdrawn) The molding manufacturing apparatus according to claim 15, wherein each of the fixed die and the movable punch has a forming surface for pressing the end portion of the molding body to bend at an acute angle.

23. (Withdrawn) The molding manufacturing apparatus according to claim 15, wherein each of the fixed die and the movable punch has a forming surface for pressing the end portion of the molding body to bend at an obtuse angle.

24. (Currently Amended) A molding manufacturing method for manufacturing a molding having an end cover portion shaped in a predetermined shape out of a co-extruded long molding body,

comprising

preparing a molding apparatus including a fixed die, a first movable punch to be used to close the fixed die, and a second movable punch, the fixed die having a back forming surface for forming a back surface of the end cover portion, the first movable punch having a sandwiching portion integrally formed with a front forming surface for forming a front surface of the end cover portion, and the second movable punch capable of changing a volume of a cavity formed between the front forming surface and the back forming surface;

setting the molding body in the fixed die in a state that an end portion of the molding body protrudes from an end of the fixed die such that a back surface side of said co-extruded long molding body which is opposite of a decorative layer faces said fixed die;

heating and softening the end portion; moving the first movable punch to close the fixed die therewith, while bringing the first movable punch into contact with the end portion to bend the end portion in a back surface side thereof, to form an end bending portion in the cavity; and

moving the second movable punch forward while the first movable punch is closed so as to reduce the volume of the cavity to be filled with a material and to apply a compressive force to the end bending portion to press said material forming the end bending portion closely onto the front forming surface of the first movable punch and the back forming surface of the fixed die, while keeping the vicinity of a bending center portion of the end bending portion in a fluid state,

wherein said first movable punch is moved in an oblique direction with respect to a longitudinal direction of the molding, so that the decorative layer of the end portion moves closer to the fixed die.

25. (Original) The molding manufacturing method according to claim 24,

wherein the first movable punch has an internal angle portion formed continuously with the front forming surface and having a radius of curvature smaller than a radius of curvature of a surface of the end bending portion.

26. (Original) The molding manufacturing method according to claim 24,

wherein the step of moving the second movable punch includes moving forward the second movable punch from a distal end of the end bending portion in a direction to shorten a length of the end bending portion.

27. (Original) The molding manufacturing method according to claim 24,

wherein, in the step of moving the first movable punch, the end portion is bent while a temperature of a distal end of the end bending portion is reduced than a temperature of a bending center of the end portion.

28. (Original) The molding manufacturing method according to claim 24,

wherein, in the step of moving the first movable punch, the end portion is bent while a hardness of a distal end of the end bending portion is made higher than a hardness of a bending center of the end portion.

29. (Original) The molding manufacturing method according to claim 24,

wherein, in the setting step, the protruding end portion of the molding body is set longer than a length of the end cover portion to be finally formed and shorter than a length of the front forming surface of the first movable punch;

in the step of moving the first movable punch, the first movable punch closes the fixed die so that an end of the end bending portion remains in the cavity; and,

in the step of moving the second movable punch, the second movable punch is moved toward a part of the cavity opposing to the end of the end bending portion.

30. (Withdrawn) A molding manufacturing apparatus for manufacturing a molding having an end cover portion shaped in a predetermined shape out of a long molding body, comprising:

a fixed die having a back forming surface for forming a back surface of the end cover portion;

a first movable punch to be used to close the fixed die, the first movable punch having a front forming surface for forming a front surface of the end cover portion; and

a second movable punch capable of changing a volume of a cavity formed between the front forming surface and the second forming surface.

31. (Withdrawn) The molding manufacturing apparatus according to claim 30,

wherein the first movable punch has an internal angle portion being formed continuously with the front forming surface and having a radius of curvature smaller than a

radius of curvature of a surface of an end bending portion of the molding body, the end bending portion to be formed into the end cover portion.

32. (Withdrawn) The molding manufacturing apparatus according to claim 30,

wherein the second movable punch is guided by the back forming surface of the fixed die to move forward and backward while being in contact therewith; and

the volume of the cavity is reduced by a forward moving motion of the second movable punch.

33. (Withdrawn) The molding manufacturing apparatus according to claim 30, further comprising:

a heating unit which is provided to the fixed die and heats the back surface of the end portion.